WE have received the report of the Falmouth Observatory for the year 1904, reprinted from the seventy-second annual report of the Royal Cornwall Polytechnic Society. This observatory has for many years done excellent work in connection with meteorology and magnetism, as well as by the collection of sea-temperature observations at various places off the coast of Falmouth. The station has for many years been adopted by the Meteorological Office as one of its first-class observatories, and hourly observations or means have been regularly published in the official reports of that office. With regard to magnetism, the Falmouth Observatory has become additionally important, in consequence of the recording magnets at Kew and Greenwich being somewhat affected by the electric trams in those neighbourhoods.

DR. ALBERTO AGGAZZOTTI, writing in the *Atti dei Lincei*, xiv., (1), 12, describes some experiments conducted in the physiological laboratory at Turin on the effects of rarefaction on the respiration of the orang-utan. The animal on which the observations were made was brought from Borneo by Count Mario Peracca, who handed it over to Prof. Angelo Mosso for the investigation. It is described as being of good disposition and intelligent; at first it resisted the attempts to place it in the receiver, and tried to destroy the apparatus, but when it realised what was being done, it not only offered no further resistance, but even helped the experimenter in attaching the pneumograph and other necessary apparatus to it. A moderate rarefaction produced no injurious effects provided that the restoration of normal pressure was not effected too rapidly; at 450 millimetres of pressure the animal became more tranquil, at 300 millimetres it fell asleep, while at 270 millimetres it became seriously ill and fell down insensible. The respiration altered in character between 450 millimetres and 470 millimetres with an increase of frequency and a decrease of intensity, while at 300 millimetres it became irregular and spasmodic. These changes fairly well agree with those observed in other animals, particularly man.

MR. C. MOSLEY has arranged an edition of White's "Selborne" for students, in which the whole of the letters are classified under subjects, giving the reader all that Gilbert White wrote on one topic under one head. As the subjects will be arranged alphabetically, the work will be one of reference as well as for reading consecutively. Mr. Elliot Stock is to publish the book during the coming season.

WE have received a copy of the first fasciculus of vol. xxxv. of the *Mémoires de la Société de Physique et d'Histoire naturelle de Genève*. This part of the transactions contains, with other interesting papers, the president's report for 1904. Dr. Auguste Wartmann-Perrot successively passes in review the administrative events of the year, refers in eulogistic terms to the work of eminent members of the society deceased during the previous year, and recapitulates briefly the scientific subjects discussed in the meetings of the society during 1904. The biographical notices contained in the president's report include those of Charles Soret, renowned for his work in crystallography; of Albert Rilliet, the chemist; and of Wilhelm His, the anatomist. The scientific activity of the society is summarised concisely under subjects, and this part of the report will serve men of science as a full index of the work done by members of the Geneva Society during 1904. The president's statement is a useful account of a good year's work.

OUR ASTRONOMICAL COLUMN.

ASTRONOMICAL OCCURRENCES IN SEPTEMBER:—

Sept. 4. Ceres in opposition to the Sun (Ceres mag. 7·4).
,, ,, 7h. 33m. to 8h. 37m. Moon occults γ Libræ (mag. 4·1).
,, 8. 10h. 20m. Minimum of Algol (β Persei).
,, 11. 12h. Moon in conjunction with Saturn (Saturn 1° 56′ S.).
,, 14. 12h. 42m. to 14h. 11m. Transit of Jupiter's Sat. III. (Ganymede).
,, 14. 23h. Mercury at greatest elongation, 17° 54′ W.
,, 15. Venus. Illuminated portion of disc = 0·787, o. Mars = 0·851.
,, 17. 10h. 35m. to 11h. 36m. Moon occults μ Ceti (mag. 4·4).
,, 18. 9h. 54m. to 10h. 55m. Moon occults *f* Tauri (mag. 4·3).
,, 19. 10h. 36m. to 10h. 59m. Moon occults γ Tauri (mag. 3·9).
,, 19. 13h. 56m. to 14h. 37m. Moon occults 71 Tauri (mag. 4·6).
,, 19. 15h. 13m. to 16h. 36m. Moon occults θ^1 Tauri (mag. 3·9).
,, 19. 15h. 18m. to 16h. 31m. Moon occults θ^2 Tauri (mag. 3·6).
,, 19. 20h. 24m. to 21h. 1m. Moon occults α Tauri (mag. 1·1).
,, 20. 14h. Ceres 9′ N. of 89 Aquarii (mag. 4·9).
,, 21. Saturn. Major axis of ring = 43″·30, Minor axis = 8″·36.
,, 19. 14h. Moon in conjunction with Jupiter (Jupiter 4° 16′ N.).
,, 28. 12h. 3m. Minimum of Algol (β Persei).

OBSERVATIONS OF PLANETS.—The results of a number of recent observations of Saturn and Jupiter are recorded by Mr. Denning in the *Observatory* for August. Using the 12½-inch Calver reflector, some excellent observations of Saturn were obtained during the morning twilight in June and July. The region north of the multiple belt in the northern hemisphere was seen to be the brightest part of the planet—not the equatorial zone, as previously. A small white spot was detected on the N. edge of the great belt on July 6, and estimated to be central at 13h. 40m. A small white spot was seen in the N. temperate zone on the following dates in the positions and at the times stated:—

	Transit time h. m.	Long. System II. °
July 13	13 20 ...	72·7
,, 16	15 35 ...	67·3
,, 21	12 35 ...	69·5

Observing the Great Red Spot on Jupiter on June 24 and July 6, Mr. Denning found it to be central at 15h. 43m. and 15h. 40m. respectively, the corresponding longitudes being 25°·1 and 24°·8. Comparing these longitudes with those published in the April *Observatory*, it is seen that during the period that Jupiter has been too near to the sun to be observable, the motion has conformed precisely with system ii. of the ephemerides based on a rotation period of 9h. 55m. 40·63s. An observation made by the Rev. T. E. R. Phillips confirms the above observation of July 6.

PROPER MOTIONS OF THE HYADES.—A discussion of the proper motions of the Hyades group is the *raison d'être* of No. 14 of the Publications of the Astronomical Laboratory at Groningen. The plates from which the proper motions were derived were obtained by Prof. Donner at Helsingfors and discussed by Profs. Kapteyn and W de Sitter.

In the introduction to the volume Prof. Kapteyn gives a most interesting discussion of the results obtained by his method of determining proper motions, the method employed in the present case, in which a plate is exposed on a certain area and then packed away for a number of years, exposed again on the same area, and then developed and measured. One of the gravest objections to this method was the fear that the plates would deteriorate during the interval between the two exposures, but Prof. Kapteyn disposes of this objection by stating that not a

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single plate of the present series, for which the interval was between four and five years, has had to be rejected. These plates were by Schleussner, on plate glass, and the method of preservation employed by Prof. Donner is explained.

As regards the length of exposure, Prof. Kapteyn states that, whilst it must be chosen in accordance with the particular work contemplated, it must be such as to give at least one hundred easily measured stars on each plate. Another objection raised against this method was that of accuracy as compared with the older method, but from a comparison of the probable errors now obtained with those obtained at Paris and Potsdam in the *carte du ciel* work, Prof. Kapteyn shows that the advantage is with the new method. He further concludes that to attain a given degree of accuracy the labour involved in the present method is *at the very least* seven times smaller than it would be by employing the older method.

The value for the proper motion of the Hyades group adopted by Prof. Donner is

$$\left.\begin{array}{l}\text{In R.A.} +0''\cdot0900 = +0\cdot00624\text{s.}\\ \text{,, Decl.} -0''\cdot0250\end{array}\right\}$$

Reduced to the system given in Publication No. 9, this becomes

$$\begin{array}{l}\text{In R.A.} +0''\cdot1107 = +0\cdot00767\text{s.}\\ \text{,, Decl.} -0''\cdot0259\end{array}$$

which is equivalent to a total proper motion of

$$0''\cdot1137 \text{ in position angle } 103^\circ\cdot17.$$

The general catalogue contains 395 stars, and of these 42 are considered as very probably belonging to the group, 19 are given as "probable," and 16 are regarded as "doubtful."

VARIATIONS OF LATITUDE.—In Nos. 4040–4041 of the *Astronomische Nachrichten* Mr. Kimura, of the International Latitude Observatory at Mizusawa, gives the results of a series of latitude observations made by Mr. Nakano and himself during the year March 28, 1903, to March 31, 1904. Simultaneous observations of four groups were made each night, their principal aims being (1) to examine whether there exists any regular diurnal change of latitude of a measurable quantity; (2) to see how large are the systematic differences between the variation of latitude from this (four groups) series of observations and that from the two groups observations for the international service. The mean declinations and proper motions of the stars observed were taken from the international service work, and the value of the "aberration constant" employed was 20″·512. Great care was taken during the reductions to eliminate accidental errors, and it was found that the personal equation between the two observers was practically negligible. The measures and their reductions are given in detail, and lead to the conclusion that "Any systematic diurnal change of latitude of a measurable quantity cannot exist at all." The subsequent comparison of the results of these observations with those obtained for the international service shows that no systematic differences exist between the four groups observations and the two groups observations made for the international service.

A PROPOSED NEW METHOD FOR DETERMINING THE SOLAR RADIATION.—In No. 4037 of the *Astronomische Nachrichten* Prof. Ceraski proposes a new method whereby the absorption of our atmosphere might be eliminated from observations of the changes in the solar radiation. His proposition is that the light of the telescopic planets should be regularly observed photometrically. If the variation of the solar radiation is great enough, it should be shown in the amount of light reflected by the planets, and a long period of photometric observations of these, such as he proposes, would show the sympathetic variations, whilst, if suitable comparison stars were employed, the differential effect of the earth's atmosphere would not affect the results.

THE CAPE OBSERVATORY.—The opening paragraphs of Sir David Gill's report for the year 1904 deeply lament the loss sustained by the Cape Observatory, and science in general, by the death of Mr. Frank McClean, F.R.S., to whose generosity the observatory owes an important part of its equipment.

The new transit circle has been thoroughly examined and its observers trained during the past twelve months, and it is now ready for routine work. It was found that by using the Repsold-Struve apparatus, in which a travelling wire actuated by clockwork is employed, the magnitude equation in right ascension observations might be almost, if not entirely, eliminated.

Preliminary trials of the new sidereal clock showed that the daily rate never varied more than ±0·03s.; but even this is to be improved by a new arrangement by which the top and bottom of the pendulum will be kept at the same temperature. In order to preserve a more equable temperature inside the case, an enclosing chamber 8 feet square and 13 feet high has been erected about it.

Owing to an unfortunate accident, the driving worm and sector of the Victoria telescope were damaged, and have had to be sent to Sir Howard Grubb for repair. In consequence, the new objective prism has not yet been tested.

A number of observations were made with the transit and equatorial instruments during the year, and 185 plates (containing 117,073 stars) for the Astrographic Catalogue were measured. The total number of plates measured is now 760, containing more than 440,000 star images, corresponding to about 200,000 different stars.

In the astrophysical department 74 star-spectra were photographed, and of these 30 have been measured, and a number of radial velocities deduced.

RECENT ADVANCES IN THE CHEMISTRY OF ALBUMIN.[1]

UNTIL recently, one of the main objects in studying the proteids was to classify them into characteristic groups by the aid of certain reactions. This has now given place to problems of a different nature—the investigation of the quantitative decomposition of the albumin molecule, the progressive degradation and study of the constituent parts, and the determination of the nature of what may be termed the stones of the molecular edifice; finally, the arrangement of these materials in the construction of the albumin molecule.

The task of separating the constituents of the albumin molecule is still far from complete. The reason for this lies in the difficulty connected with their isolation, for they are particularly troublesome to purify. An important advance was made when Emil Fischer discovered the ester method of separating the amino-acids by distilling them in a vacuum. The method bore immediate fruit in the discovery of phenylalanine and α-proline (pyrrolidinecarboxylic acid). Fischer has shown, moreover, that certain amino-acids, like alanine, phenyl-alanine, and serine (hydroxyaminopropionic acid) are invariable constituents of the albumin molecule, whilst hydroxy-α-proline, discovered by Fischer, is another widely distributed constituent. Ehrlich has found that the leucine from albumin, long considered a simple substance, is a mixture of at least two bodies. Hopkins and Cole have succeeded in separating tryptophane in a pure state, a substance which had long eluded the attempts of physiologists to isolate, and which they have pronounced to be skatolaminoacetic acid. Skraup has obtained from casein a whole series of new products belonging to the group of diamino- and hydroxyamino-acids—diaminoglutaric acid, diaminoadipic acid, hydroxyaminosebacic acid and caseanic and caseinic acids of unknown structure.

New substances are constantly being added to the list of what may be termed molecular fragments, which now amount to about twenty individuals.

There still remains the carbohydrate group of albumins. F. Müller has shown that glucosamine from mucine and egg-albumin forms an interesting link between the sugar group and the amino-acids. We are still ignorant of the part played by the carbohydrate in its connection with albumin. We cannot say whether it is a loose combination or a mechanical admixture.

The enormous number of products gives some indication of the complexity of the problem which the study

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[1] Abstract of an article by Emil Abderhalden contributed to "Medizinische Klinik," 1905, Nos. 1 and 2.

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